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BACTERIOLOGICAL PROFILE OF CHRONIC SUPPURATIVE OTITIS MEDIA (CSOM) FROM A RURAL AREA OF JAIPUR, RAJASTHAN.

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ABSTRACT **Aims:** Otitis media is a serious infection in the developing countries, which causes serious threatening complications to the patients. The purpose of the present study was to determine the profile and antimicrobial susceptibility pattern of isolates from pus discharge in CSOM. **Material and Methods:** This study included a total of 115 patients of CSOM with unilateral or bilateral discharge attending department of ENT in NIMS hospital, Jaipur, India from January 2019 to July 2019. Samples were inoculated on Blood and MacConkey agar for 24- 48 hrs and identification of organism was done by using standard biochemical test and antimicrobial susceptibility testing done by using modified Kirby Bauer method as per CLSI guidelines. **Result:** Among 115 patients included in the study, most of the patients were between age group 11-20 years (39.13%). CSOM was found more in the male patients (61.73%) as compared to female (38.26%) patients. The most common organisms were: Pseudomonas aeruginosa (46.08%), Staphylococcus aureus (33.19%), Proteus species (6.95%), Escherichia coli (3.47%), Coagulase negative Staphylococcal species (CONS) (5.21%), Klebsiella species, (2.60%), and Citrobacter (1.73%). In our study the Staphylococcus. aureus showed100% sensitivity to Vancomycin and Linezolid. **Conclusion:** Pseudomonas aeruginosa is the main frequent isolate followed by Staphylococcus aureus. The study of microbial pattern and their antibiotic sensitivity determines the widespread bacterial organisms causing CSOM in local area and start practical and more targeted healing of otitis media and its complications for successful outcome, thus to prevent the emergence of resistant strains.

KEYWORDS : :CSOM, Pathogens, Susceptibility testing.

INTRODUCTION

Chronic suppurative otitis media is defined as chronic inflammation of middle ear cavity that may present with recurrent ear discharge through a tympanic perforation [1]. Chronic suppurative otitis media is one of the most common chronic diseases of childhood. It is also one of the major causes of deafness in India. It is more common found in the lower socioeconomic group. Most of the studies in microbiology on CSOM has revealed that the most common bacteria associated with CSOM are Pseudomonas, Staphylococcus aureus, Proteus and Klebsiella species [2]. The bacteria are uncommon in the skin of the external auditory canal, but in the presence of trauma, inflammation or high humidity these may proliferate [3]. It has received considerable attention, not only because of its high incidence and chronicity, but also because of issues such as drug resistance and ototoxicity with both topical and systemic antibiotics [4]. This study was done to find the local pattern of aerobic microbes and their antimicrobial sensitivity pattern in cases of CSOM. This will be helpful in making a protocol for empirical therapy for starting to early treatment.

MATERIAL & METHODS

Sample Collection:

One hundred fifteen patients with CSOM who presented to the ENT department in NIMS hospital Jaipur from January 2019 to July 2019 were prospectively studied. The discharge was frankly purulent, muco-purulent, serous or blood stained on occasion. Sample collection as per the standard protocol was done. Sterile cotton swabs were used to collect ear discharge from CSOM patients. Only those patients who had not taken any treatment either systemic or local for the last seven days were included in the study [4].

Culture Identification:

Sterile cotton swabs were used to perform culture. Organisms were identified by using biochemical tests with standard procedures [4, 5, 6]. Antimicrobial sensitivity testing of the isolates was carried out by the modified Kirby Bauer disc diffusion method on Muller Hinton agar. Results were interpreted in accordance with Clinical Laboratory and Standard Institute guidelines (CLSI-2019) [7].

RESULTS

A total of 115 cases were randomly selected (n=115) of which were males 71 (83%) and 44 (61.73%) were females. Higher infection rate was observed in age group 11-20 year followed by 21-30 year, <10 year, 31-40 year, 41-50 year, >50 year respectively [**Table No. 1**]. Out of 115 patients, 57 (49.56%) had right, 34 (29.56%) had left and 24 (20.86%) had bilateral ear discharge [**Table No.2**]. The most common organism isolated was Pseudomonas aeruginosa followed by Staphylococcus aureus as shown in **Table No.3**. In Staphylococcus aureus, 100% sensitivity was found to Linezolid and Vancomycin followed by Cefoperazone / Sulbactam, Amikacin, Clindamycin, Piperacillin / Tazobactam, Erythromycin and Ofloxacin as shown in **Table No.4**. Gram negative bacteria showed maximum sensitivity to Piperacillin / Tazobactam followed by Amikacin & Cefoperazone / Sulbactam. Lesser sensitivity was observed with Ticarcillin / Clavulenic acid, Gentamycin & Ciprofloxacin. Least sensitivity was seen with Piperacillin & Cotrimoxazole as shown in Table No.5.

Table 1: Age wise distribution of patients (n=115)

Age	Number (%)
<10 year	14 (12.17%)
11-20 year	45 (39.13%)
21-30	40 (34.78%)
31-40	8 (6.95%)
41-50	7 (6.08%)
>50	1 (0.86%)

Table 2: Site distribution (n=115)

Site	Number (%)
Right Ear	57 (49.56%)
Left Ear	34 (29.56%)
Bilateral	24 (20.86%)

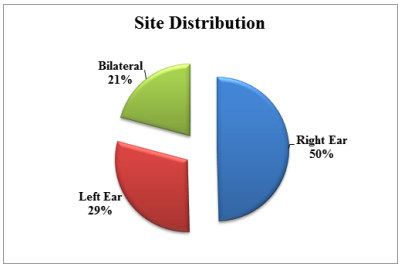


Table 3: Bacteriological Profile of CSOM (n=115)

Bacteria	Percentage
P. aeruginosa	46.08%
S. aureus	33.19%
Proteus spp.	6.95%
Coagulase negative Staphylococccus (CONS)	5.21%
E .coli	3.47%
Klebsiella spp.	2.60%
Citrobacter	1.50%

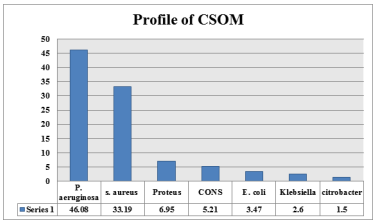


Table 4: Antibiotic Susceptibility Pattern of Staphylococcus aureus

Antibiotics	Percentage (%)
Vancomycin	100%
Linezolid	100%
Cefoperazone/ Sulbactum	85%
Amikacin	75%
Clindamycin	70%
Piperacillin /Tazobactam	60%
Erythromycin	45%
Ofloxacin	30%

Antibiotic sensitivity pattern of Staphylococcus aureus

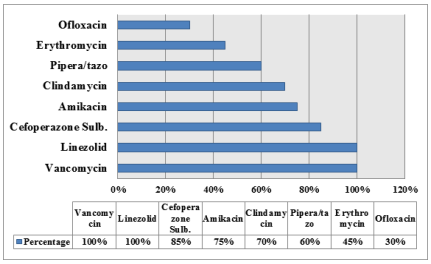


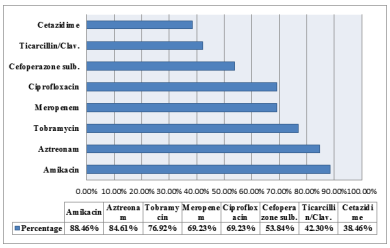
Table 5: Antibiotic Susceptibility Pattern of Gram Negative isolates (I)

Antibiotics	E. coli (%)	Klebsiella Spp.(%)	Citrobacter Spp.(%)
Piperacillin	75.5	56	38
Amoxicillin	54	28.5	44
Ciprofloxacin	84.5	70	71
Gentamycin	77	68.8	59
Cefoperazone/ sulbatum	98	72.5	78.5
Amikacin	95.5	85	79.5
Piperacillin/ tazobactam	90	71	81
Ticarcillin/ clavulanic acid	100	85.5	44

Table 6: Antibiotic Susceptibility pattern of Pseudomonas Isolates (II)

Antibiotics	Percentage (%)
Amikacin	88.46%
Aztreonam	84.61%
Tobramycin	76.92%
Meropenem	69.23%
Ciprofloxacin	69.23%
Cefoperazone sulbactam	53.84%
Ticarcillin/Clavulanic acid	42.30%
Ceftazidime	38.46%

Antibiotic Susceptibility pattern of Pseudomonas Isolates



DISCUSSION

CSOM is a serious infection associated with various complications. Early microbiological diagnosis ensures prompt and effective treatment to avoid such complications leading to hearing loos. High prevalence of culture positive cases of CSOM was seen in the present study. We found that the CSOM was more prevalent in the first and second decade of life and accounted for 51% of the cases. This finding was in agreement with the observations made by other researchers [8]. In our study, males were more commonly affected than females and which is in concordance with findings of Ahmad et al (1999) [9] in which males were 57.3% and females were 42.7% [4, 10]. In our study, CSOM was most prevalent in the age group 11-20 years followed by 21-30 years. Similar results were reported by Mansoor et al. (2009) [11], Wariso et al.(2006)[12] and Poorey et al.(2002)[13]. High prevalence of CSOM in children may be attributed to the fact that they are more prone to upper respiratory tract infections [14]. In the present study, the most common bacterial isolates were Pseudomonas aeruginosa (46.08%), Staphylococcus aureus (33.19%), Proteus species (6.25%), Coagulase negative Staphylococcus aureus (5.2%), Escherichia Coli (3.47%), Klebsiella (2.60%) and Citrobacter species (1.73%) which is similar to studies conducted by Mansoor et al (2009)[11], Argeudas et al.(1994)[15] and Kenna et al. (1986)[16]. But in contrast to it Loy et al.(2002)[17] reported Staphylococcus aureus as the major causative agent[3]. The slight differences observed in the isolates and species may be because of geographical and/or ethnic variations. Antibiotic susceptibility patterns serve as a useful guideline for choosing the appropriate antibiotic. In the present study, majority of gram positive isolates were more sensitive to Vancomycin & Linezolid followed by Cefoperazone / Sulbactam, Amikacin, Clindamycin & Piperacillin / Tazobactam. Gram negative isolates were more sensitive to Ticarcillin / Clavulenic acid followed by Piperacillin / Tazobactam and Cefoperazone/ Sulbactam. Pseudomonas aeruginosa were sensitive to carbapenems (Imipenem, Meropenem), Aztreonam and aminoglycosides (amikacin and gentamicin). It is supported by previous studies like Mansoor T et al (2009) [11]. Variation in sensitivity to antibiotics may be due to other mechanisms of resistance such as impermeability of outer membrane and or active efflux mechanism and there may be geographical variations [3].

CONCLUSION

Continuous and periodic evaluation of microbiological pattern and antimicrobial susceptibility of CSOM isolates is necessary to decrease the potential risk of complications by early institution of appropriate treatment. Our finding is in tandem with the pattern of CSOM infection within the tropical region. It is seen that both gram positive and gram negative micro-organisms are responsible for infection of middle ear. We believe this will be helpful for an effective management of CSOM.

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